

# Water and Wastewater Evaluation for Proposed Improvements

for

Ragged Point Inn and Resort  
Ragged Point, CA

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Prepared by:



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## 1.0 BACKGROUND

The Ragged Point Inn and Resort (RPI) is located off Highway 1, north of San Simeon California. The property is comprised of a 39 unit motel resort with a restaurant, gas station, mini mart, and employee housing complex. The Inn is served by a private water system and on-site domestic wastewater treatment facility.

RPI is proposing a series of renovations and upgrades, built out in five phases. The renovation project is proposed to provide additional patio dining area, new employee housing, upgraded snack bar and gas station, a day spa, and an additional 50 motel units. The following report has been prepared to evaluate the existing water and wastewater system and provide recommendations on system capacity due to the planned improvements.

## 2.0 PROPOSED PROJECT

Upgrades to RPI will be accomplished in five phases, shown in Figure 1 in Appendix A. A summary of the elements proposed for each phase is provided in Table 1.

| Table 1. RPI Upgrade Project Elements by Phase |   |
|--|---|
| Phase  | PROJECT ELEMENTS  |
| Phase 1<br>(Year 2017)                         | <ul style="list-style-type: none"><li>• Demo and remove existing single family residence</li><li>• Demo and remove spa deck and storage shed</li><li>• Construction of 10 new motel units (Cliff House South)</li><li>• Construction of 6 new guest rooms (Cliff House North)</li><li>• Construction of 2 new retail stores</li><li>• Remodel of existing gas station and restroom facilities</li></ul> *16 new motel units created in this phase |
| Phase 2<br>(Year 2018)                         | <ul style="list-style-type: none"><li>• Demo existing employee housing and service yard</li><li>• Construction of 5 employee housing rooms</li><li>• Construction of maintenance and laundry facilities</li><li>• Construction of 2 new guest rooms</li></ul> *2 motel units will be created in this phase  |
| Phase 3<br>(Year 2019)                         | <ul style="list-style-type: none"><li>• Renovation of existing restaurant and bar</li><li>• Construction of new fast food restaurant</li><li>• Construction of 12 new guest rooms</li><li>• Construct/re-locate new wastewater treatment facility</li></ul> *12 motel units will be created in this phase   |
| Phase 4<br>(Year 2021)                         | <ul style="list-style-type: none"><li>• Remodel of existing 17 unit motel</li><li>• Construction of 19 new guest rooms</li><li>• Outdoor recreational area with landscaping, walkways and patios</li></ul> *19 motel units will be created in this phase<br>*17 existing units will be <u>demolished</u> in this phase  |

|                        |   |
|------------------------|---|
| Phase 5<br>(Year 2022) | <ul style="list-style-type: none"> <li>• Construction of new exterior spas with terraces</li> <li>• Construction of massage center with therapy rooms</li> <li>• Renovation and landscaping of area previously occupied by the wastewater treatment facility</li> </ul> <p>*No motel units demolished or created in this phase.</p> |
|------------------------|---|

### 3.0 WASTEWATER SYSTEM

The Ragged Point Inn wastewater treatment system consists of a secondary treatment extended aeration facility with flow equalization. The wastewater facility is permitted for 15,000 gallons per day (gpd) under the Regional Water Quality Control Board NPDES Permit No. R3-2009-0020, dated June 1, 2009.

Raw wastewater from the hotel, restaurant, gas station, and employee housing complex is collected and transported to the wastewater treatment facility via a gravity collection system. The following table outlines the design parameters of the system:

| <b>Table 2. Existing Wastewater Influent Characteristics</b> |              |              |
|--|--------------|--------------|
| <b>PARAMETER</b>   | <b>UNITS</b> | <b>VALUE</b> |
| Maximum Permitted Flow                                       | gpd          | 15,000       |
| Flow (Avg. Summer)   | gpd          | 10,000       |
| Flow (Avg. Winter)   | gpd          | 6,000        |
| Biochemical Oxygen Demand (BOD)                              | mg/l         | 250          |
| Suspended Solids (TSS)                                       | mg/l         | 275          |
| Dissolved Solids (TDS)                                       | mg/l         | 500          |

The existing wastewater facility is an extended aeration plant that discharges undisinfected secondary effluent. Disinfection facilities were incorporated in 2014, which are used only if required during ocean discharge. One of the elements of the RPI project upgrades is to re-locate the wastewater treatment facility and provide new, upgraded, treatment equipment that will be able to provide recycled water for landscape irrigation on-site.

The new wastewater facility will be a Membrane Bioreactor (MBR), which will include an extended aeration secondary treatment process with suspended-growth system that maintains a population of organisms by recycling settled biomass. The biomass converts soluble and biodegradable organic matter into cell mass and metabolic end products. The biomass is eventually separated from the wastewater through settling in a clarifier for recycling or wasting to the sludge handling process. Following the clarifier, treated effluent goes through a membrane filter to remove any remaining constituents to

produce recycle-quality water. The effluent is then disinfected with chlorine to remove any remaining pathogens, and dechlorinated for use as landscape irrigation water. The treatment process includes the following:

- Flow equalization
- Extended Aeration with subsurface diffused air
- Clarification
- Filtration
- Chlorination/Dechlorination
- Effluent disposal

Distribution of treated effluent from the existing wastewater treatment facility is accomplished via an above-ground forcemain along the outside perimeter of the Inn property. Lateral tubing with drip emitters are laid along the cliff edge to allow water to drip down the cliff side. Evapotranspiration from cliff side vegetation, and evaporation from the cliff rocks are the means of effluent disposal. The entire area, distribution piping, lateral lines, and cliff side, is fenced off from public contact via a 5 foot tall chain link fence.

Implementation of the new MBR wastewater treatment system will allow RPI to reuse the treated effluent for on-site landscape irrigation, which will be the main method of disposal. The current cliff side evapotranspiration system will be maintained as a back up disposal system in the event landscape irrigation is not needed.

### **3.1 Existing Wastewater Flows**

A summary of the 2013 average monthly flows is provided in Table 3. Average flows are around 7,500 gpd, with peak flows around 13,000 gpd on busy weekends.

| <b>Table 3. 2013 RPI Wastewater Flows</b> |                           |                       |
|---|---------------------------|-----------------------|
| <b>Month</b>                              | <b>Average Flow (gpd)</b> | <b>Max Flow (gpd)</b> |
| January                                   | 5,484                     | 9,366                 |
| February                                  | 5,810                     | 11,718                |
| March                                     | 7,288                     | 11,966                |
| April                                     | 6,698                     | 8,945                 |
| May                                       | 7,708                     | 13,022                |
| June                                      | 7,999                     | 11,622                |
| July                                      | 9,416                     | 12,219                |
| August                                    | 9,125                     | 11,470                |
| September                                 | 9,050                     | 11,742                |
| October                                   | 7,778                     | 11,378                |
| November                                  | 7,287                     | 12,808                |
| December                                  | 7,014                     | 12,690                |

### 3.2 Proposed Wastewater Flows

Table 4 outlines the assumptions that were made to determine how the future upgrades and renovations would affect the wastewater system.

| <b>Table 4. Proposed Wastewater Flow at Build-Out</b> |                                    |                               |
|---|------------------------------------|-------------------------------|
| <b>No.</b>  | <b>Detail</b>                      | <b>Unit/Day</b>               |
| 39  | Existing Hotel Units               | 175 gallons/room <sup>1</sup> |
| 49  | New Hotel Units                    | 150 gallons/room <sup>2</sup> |
| 350   | Max people per large event         | 5 gallons/person              |
| 5   | Max employees housing units        | 50 gallons/person             |
| 10  | Max daytime employees              | 10 gallons/person             |
| 500   | Max customers per day (restaurant) | 5 gallons/person              |

<sup>1</sup>2.5 people per room @ 70 gallons per person

<sup>2</sup>2.5 people per room @ 60 gallons per person (assuming low flow fixtures for new units)

| <b>Table 5. Future Wastewater Flow Projections from Hotel Units Only<sup>1</sup></b> |              |              |              |               |               |               |
|--|--------------|--------------|--------------|---------------|---------------|---------------|
|  | Existing     | Phase 1      | Phase 2      | Phase 3       | Phase 4       | Phase 5       |
| Year   | 2016         | Fall 2017    | Fall 2018    | Fall 2019     | Spring 2021   | Spring 2022   |
| No. Of Existing Rooms  | 39           | 39           | 39           | 39            | 22            | 22            |
| No. of New Rooms   | 0            | 16           | 2            | 12            | 19            | 19            |
| Flow for Existing Rooms <sup>2</sup>   | 6,825        | 6,825        | 6,825        | 6,825         | 3,850         | 3,850         |
| Cumulative Flow per New Rooms <sup>3</sup>   | 0            | 2,400        | 2,700        | 4,500         | 7,350         | 7,350         |
| <b>Cumulative WW Flow<sup>1</sup></b>  | <b>6,825</b> | <b>9,225</b> | <b>9,525</b> | <b>11,325</b> | <b>11,200</b> | <b>11,200</b> |

<sup>1</sup>Flow in gallons per day

<sup>2</sup>2.5 people per room @ 70 gallons per person

<sup>3</sup>2.5 people per room @ 60 gallons per person (assuming low flow fixtures in new units)

As shown in Table 6, the existing wastewater treatment facility would need to be upgraded as part of the Phase 3 improvements in order to adequately serve RPI because wastewater flows exceed the 15,000 gallon per day maximum capacity of the existing system.

| <b>Table 6. Total Future Build-Out Wastewater Flows</b> |               |               |               |               |               |
|---|---------------|---------------|---------------|---------------|---------------|
|   | Phase 1       | Phase 2       | Phase 3       | Phase 4       | Phase 5       |
| Cumulative Hotel Room WW Flow <sup>1</sup> (gpd)        | 9,225         | 9,525         | 11,325        | 11,200        | 11,200        |
| Events <sup>2</sup> (350 ppl max)                       | 1,750         | 1,750         | 1,750         | 1,750         | 1,750         |
| Live-in Employees <sup>3</sup>                          | 980           | 600           | 600           | 600           | 600           |
| Day Employees <sup>4</sup>                              | 100           | 100           | 100           | 100           | 100           |
| Restaurant Customers <sup>5</sup>                       | 2,400         | 2,400         | 2,400         | 4,000         | 4,000         |
| <b>Total WW Flow (gpd)</b>                              | <b>14,455</b> | <b>14,375</b> | <b>16,175</b> | <b>17,650</b> | <b>17,650</b> |

<sup>1</sup>From Table 5

<sup>2</sup>Wastewater generation calculated at 5 gallons per person.

<sup>3</sup>Existing employee units calculated as 60 gallons per person; Future employee housing units calculated at 50 gallons per person to take into consideration lower flow fixtures.

<sup>4</sup>Day employee wastewater generation calculated at 10 gallons per person per day.

<sup>5</sup>Phases 1 – 3 assumed that maximum customers per day is 300 with an average wastewater generation of 8 gallons per person. After Phase 3 is complete, maximum customers is assumed to be 500 per day.

### **3.3 Wastewater Recommendations**

The increase in hotel units during Phase 3 results in a buildout wastewater flow that surpasses the current wastewater treatment facility design capacity of 15,000 gpd. The new wastewater treatment plant will be installed during Phase 3 of the project to meet projected wastewater demands. The capacity of the new wastewater facility should meet or exceed the maximum buildout flow of 17,650 gpd. The new wastewater treatment plant will be re-located to the southern edge of the property. By the time Phase 5 is implemented, tertiary recycling will produce approximately 15 acre feet per year of water that can be used to offset the irrigation demand.

## **4.0 WATER SYSTEM**

The water supply system at RPI consists of three surface water sources and one well. The Ragged Point public water system is operated under Domestic Water Supply Permit No. 4000684 dated May 10, 2010 by County of San Luis Obispo Environmental Health Services. The permit states that the Ragged Point Inn and water system is a nontransient-noncommunity system. Water use at RPI includes domestic (indoor) use, and irrigation of lawn and ornamental landscape areas.

### **4.1 Water Supply**

The water supply is provided by three water right diversions from surface water sources and an on-site well. A map of the surface water sources is provided in Appendix A.

#### **License 9357**

The Inn's most senior water right is an appropriative right licensed by the State Water Board under License 9357. This water right allows year-round diversion from Twin Springs Creek and Waterfalls Creek for domestic use at the Inn.

License 9357 allows the diversion of up to 8,000 gallons per day (gpd) up to a maximum of five acre-feet per year.

**Certificate R533**

Certificate R533 is an appropriative water right issued by the State Water Board and provides for a year-round water supply of 4,500 gpd, not to exceed five acre-feet per year.

**Riparian Water Right**

The Ragged Point Inn also holds a riparian water right (an appropriative water right initiated before 1914) that entitles the Inn to divert a portion of the water flowing past the property within the watershed. This water right allows up to 8 gpm, year round. This corresponds to a total annual capacity of about 13 AFY.

**On-Site Water Well**

The Inn drilled an on-site water well in 2010 to supplement their water supply system. The well produces 11 gpm and it is assumed the safe yield of the well limits pumping to 20 hours per day. Therefore the well provides approximately 13,200 gpd, or 14.8 AFY of water for the Inn.

Table 7 outlines the maximum capacity of each of the water supply sources. The maximum annual capacity based on water rights and well pumping is 37.8 acre-feet per year (AFY), which corresponds to 13,400,000 gallons per year.

| <b>Table 7. Ragged Point Inn Water Supply</b> |                        |                              |
|---|------------------------|------------------------------|
|   | <b>Gallons Per Day</b> | <b>Annual Capacity (AFY)</b> |
| License 9357                                  | 8,000                  | 5                            |
| Certificate R533                              | 4,500                  | 5                            |
| Riparian Water Right <sup>1</sup>             | 11,520                 | 13                           |
| On-Site Well <sup>2</sup>                     | 13,200                 | 14.8                         |
| Total   | 37,220                 | 37.8                         |

**4.2 Existing Water Use**

Water use at RPI consists of domestic (indoor) use, as well as irrigation of turf lawn area and ornamental landscape around the site. The Inn's current average annual water use is approximately 3.5 to 4.5 million gallons (13.8 AFY), based on water use data accumulated from 2005 to 2009.

The new facility will have approximately 4.8 acres of ornamental landscape and grasses that will need to be irrigated. Monthly irrigation demand is estimated to be approximately 0.92 acre feet during the peak season.



#### **4.3 Projected Water Use**

Projected water use was calculated to determine if the current supply is sufficient to serve the proposed improvements planned for the Inn. Recycling wastewater and using it for landscape irrigation is estimated to offset the entire annual irrigation demand.

Using a peak build-out water demand of 531,900 gallons per month, an annual peak water demand of 6,382,800 gallons per year (20 AFY) can be anticipated. If the irrigation demand were to be added to the water demand due to the inability to use recycled wastewater, the total water demand would increase to 31 AFY (20 AFY domestic + 11 AFY irrigation). Because the RPI supply capacity is 37.8 AFY, the Inn has sufficient water supply to meet current and projected domestic and irrigation water demands.

## **APPENDIX A – FIGURES**

**1 - SITE PLAN OF PROPOSED IMPROVEMENTS**

**2 - MAP OF WATER SUPPLY SOURCES**

# PROJECT PHASES

## RAGGED POINT INN & RESORT



### PHASE 1 - CLIFF HOUSES

- Cliff House South
- Cliff House North
- Retail/Commercial

### PHASE 2 - EMPLOYEE HOUSING

- Employee Housing
- Maintenance Facility
- Resort Laundry
- Resort Office

### PHASE 3 - WATERFALL

- Waterfall House
- Restaurant and Bar

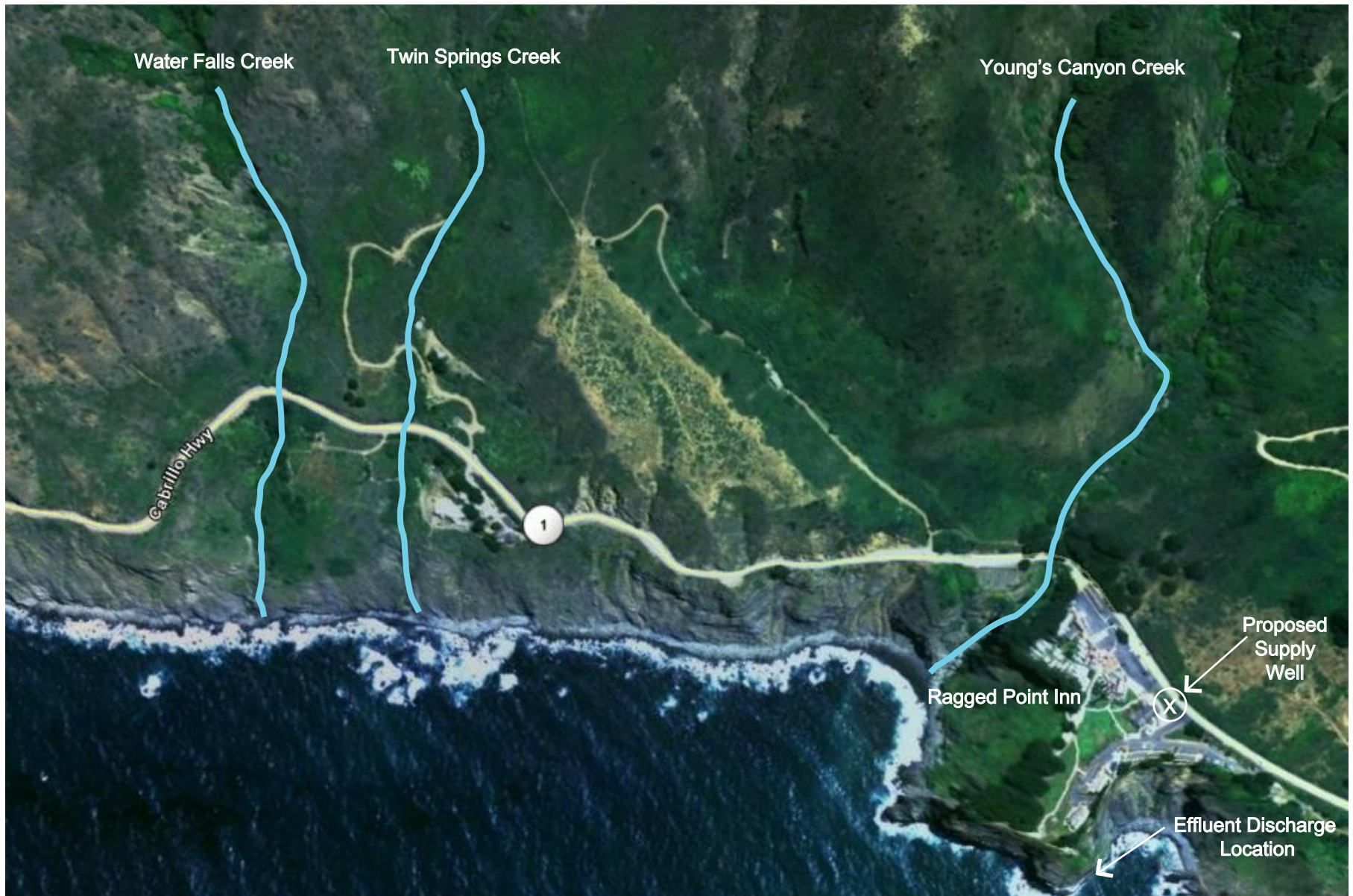
### PHASE 4 - WHITE ROCK COVE

- White Cove House

### PHASE 5 - SPA

### ALL PHASES

- Installation of permeable pavement parking lots.
- Walkways and Gardens
- Installation of new underground utilities



## Ragged Point Inn

Proposed New Water Supply Well

January 5, 2010

